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(72) Inventor: **Rigolio, Riccardo**
21057 Olgiate Olona (Varese) (IT)

(74) Representative: **Cicogna, Franco**
Ufficio Internazionale Brevetti
Dott.Prof. Franco Cicogna
Via Visconti di Modrone, 14/A
20122 Milano (IT)

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(71) Applicant: **Rigo S.r.l.**
21057 Olgiate Olona (Varese) (IT)

(54) **Delivery gun for delivering polyurethane mixed with a forming gas**

(57) A delivery gun, specifically designed for polyurethane, comprises a body having a delivery tubular element communicating with a vessel holding therein a material to be delivered, and a rod longitudinally sliding in the tubular element and having a conic end portion for engaging a delivery opening of the tubular element, the longitudinal movement of the rod being limited by limit

means comprising a rotary element coupled to the gun body and which can be operated from outside, the rotary element being kinematically coupled to an abutment element which can slide with respect to the body due to the rotary movement of the rotary element.

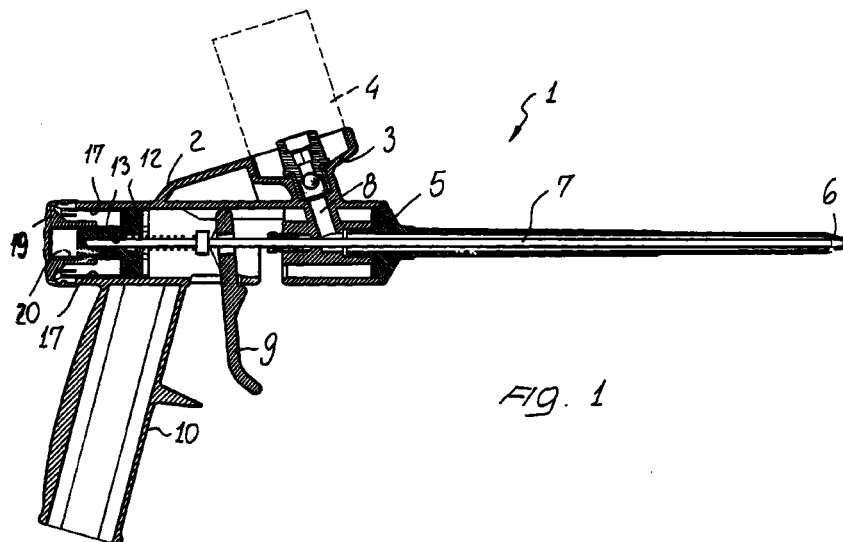


Fig. 1

EP 1 084 809 A1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a delivery gun, which has been specifically designed for delivering polyurethane to which a propelling and foaming gas has been added.

[0002] As is known, for applying foamed polyurethane, a delivery gun is conventionally used, which allows to deliver or meter the polyurethane material held in a holding vessel together with the foaming gas.

[0003] The product, exiting the gun in the form of a foam, can be used and applied in an adjustable manner.

[0004] Prior polyurethane delivery guns comprise a gun body, to which a polyurethane bottle can be coupled, which communicated with the inside of a tubular element perforated at its free end portions and there-through a sliding rod is caused to pass.

[0005] The mentioned rod is provided with a conical end portion, adapted to plug or shut-off the perforated end portion, also conical, of the mentioned tubular element.

[0006] By sliding the rod, an annular opening at the end portion of the tubular element is disengaged, thereby allowing the polyurethane material and foaming agent held in the tubular element and coming from the bottle to exit.

[0007] The rod displacement amount controls the size variation of the annular opening and, accordingly, the delivered polyurethane amount.

[0008] Thus, an operator can, by operating a trigger lever, coupled to the rod, easily adjust the delivered or metered polyurethane amount.

[0009] In order to provide a limit of stroke feature, during the opening movement, of the rod, the delivery gun comprises a bottom element which can be screw coupled to the body of the gun, thereby, by screwing on or off said bottom element, the position of the latter with respect to the gun body can be easily adjusted, thereby also adjusting the limit of stroke position of the rod.

[0010] The above disclosed adjustment bottom element construction is affected by some drawbacks, of constructional nature, and, most importantly, can cause the bottom element to be accidentally disengaged during the gun use.

SUMMARY OF THE INVENTION

[0011] Accordingly, the aim of the present invention is to provide such a delivery or metering gun, allowing to overcome the above mentioned drawbacks.

[0012] Within the scope of the above mentioned aim, a main object of the present invention is to provide such a delivery gun including an improved system for adjusting the limit of stroke position of the rod thereof.

[0013] Another object of the present invention is to provide such a delivery or metering gun, in which the

bottom element is not screw engaged.

[0014] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a delivery gun, specifically designed for delivering foamed polyurethane, comprising a gun body, including a delivery tubular element, communicating with a material to be delivered vessel, and adapted to be coupled to said body, a sliding rod longitudinally sliding in said tubular element and having a conical end portion for engaging a delivery opening, said rod being adapted to disengage said opening during a backward movement thereof, the stroke of said rod being limited by end of stroke limit means and being characterized in that said end of stroke limit means comprise a rotary element, coupled to said body, and adapted to be driven from the outside, said rotary element being kinematically coupled to an abutment element, slidable with respect to said body, due to the rotary movement of said rotary element, and adapted to define the rear limit of stroke position of said rod.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of the delivery gun according to the invention, which is illustrated, by way of an indicative, but not limitative, example, in the accompanying drawings, where:

Figure 1 is a cross-sectioned side view of a delivery gun according to the invention;

Figure 2 is a partial enlarged and cross sectioned elevation view of that same delivery gun shown in Figure 1;

Figure 3 is an enlarged detail front view of the abutment element;

Figure 4 is an enlarged detail side view of the abutment element;

Figure 5 is a further enlarged detail side view of the bottom element-abutment element-end rod assembly.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] With reference to the number references of the above mentioned figures, the delivery gun according to the present invention, generally indicated by the reference number 1, comprises a gun body 2 provided with a fitting 3 for a vessel 4 adapted to hold therein a material to be delivered or metered, for example a polyurethane and foaming gas bottle.

[0017] To the body 2 an extension element 5 can be coupled, said extension element comprising a tubular element including a free end portion with a delivery opening 6 having a conical longitudinal cross-section.

[0018] The inner cavity of the tubular element 5 is

coupled to the vessel 4 through a duct 8, thereby the material to be delivered can pass to the delivery opening 6 to be metered or delivered.

[0019] A delivery rod 7 is arranged in the cavity of the tubular element 5 and can longitudinally slide therein.

[0020] More specifically, said rod 7 has a conical front end portion, for shutting-off the delivery opening 6 in its closure position and, by backward sliding, being adapted to adjustably open the delivery opening 6, due to the tapering or conicity of said rod.

[0021] The back sliding of the rod 7 is controlled by an operating or driving lever 9, coupled to the gun body 2 and which can be manually operated by the user, gripping the delivery gun by a gun grip portion 10.

[0022] The rear end portion 11 of the rod 7 is adapted to engage in a blind hole 13 of an abutment element 12, which can slide in the gun body 2.

[0023] An annular recess 14 of the abutment element 12 is adapted to receive therein an end portion of a coil spring 15 coaxial with the rod 7 and having the other end portion thereof abutting against a flange 16 of the rod 7.

[0024] Thus, the coil spring 15 will drive the rod 7 to be closure position thereof.

[0025] The abutment element 12 can slide in the gun body 2, but it cannot turn about its longitudinal axis, through guides 17 formed in the gun body 2 and is provided with a threaded portion 18, adapted to engage a ring-nut 20 formed in a rotary element 19.

[0026] The latter comprises a bottom element, on the outside of the gun body 2, and which can be turned or rotated by the operator in order to axially drive or displace the abutment element 12 thereby adjusting the end of stroke position of the rod 7.

[0027] The rotary element 19, in particular, can be snap assembled on the gun body 2, to be able of rotating, without disengaging or longitudinally moving.

[0028] The operation of the delivery gun according to the present invention would be very simple.

[0029] Actually, it would be sufficient to apply a polyurethane bottle to the fitting 3, in a per se known manner, and operate the lever 9 to deliver the desired product amount, by adjusting the displacement of the rod by operating said lever.

[0030] The maximum amount of product which can be delivered or metered will depend on the end of stroke position of the rod 7, which can be easily adjusted by turning the rotary element 19.

[0031] The latter can comprise signalling elements for signalling the end of stroke or limit position, such as notches or other indicating marks, allowing a user to easily detect the position of the adjusting element.

[0032] Thus, it should be apparent that the invention fully achieves the intended aim and objects, since the subject delivery gun can be easily adjusted by a bottom element for adjusting the maximum delivered amount, said bottom element turning with respect to the

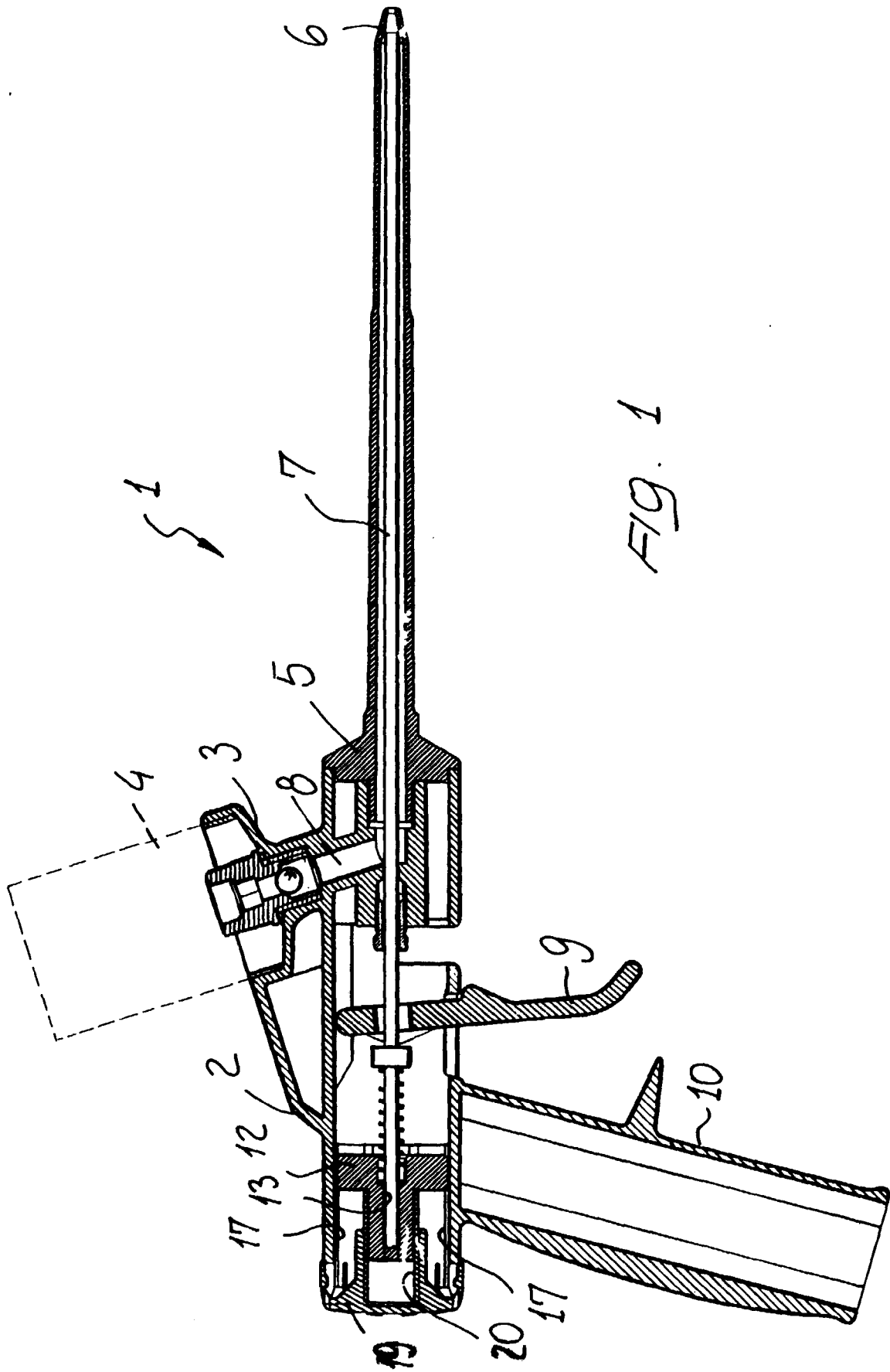
gun body, without threading on or off.

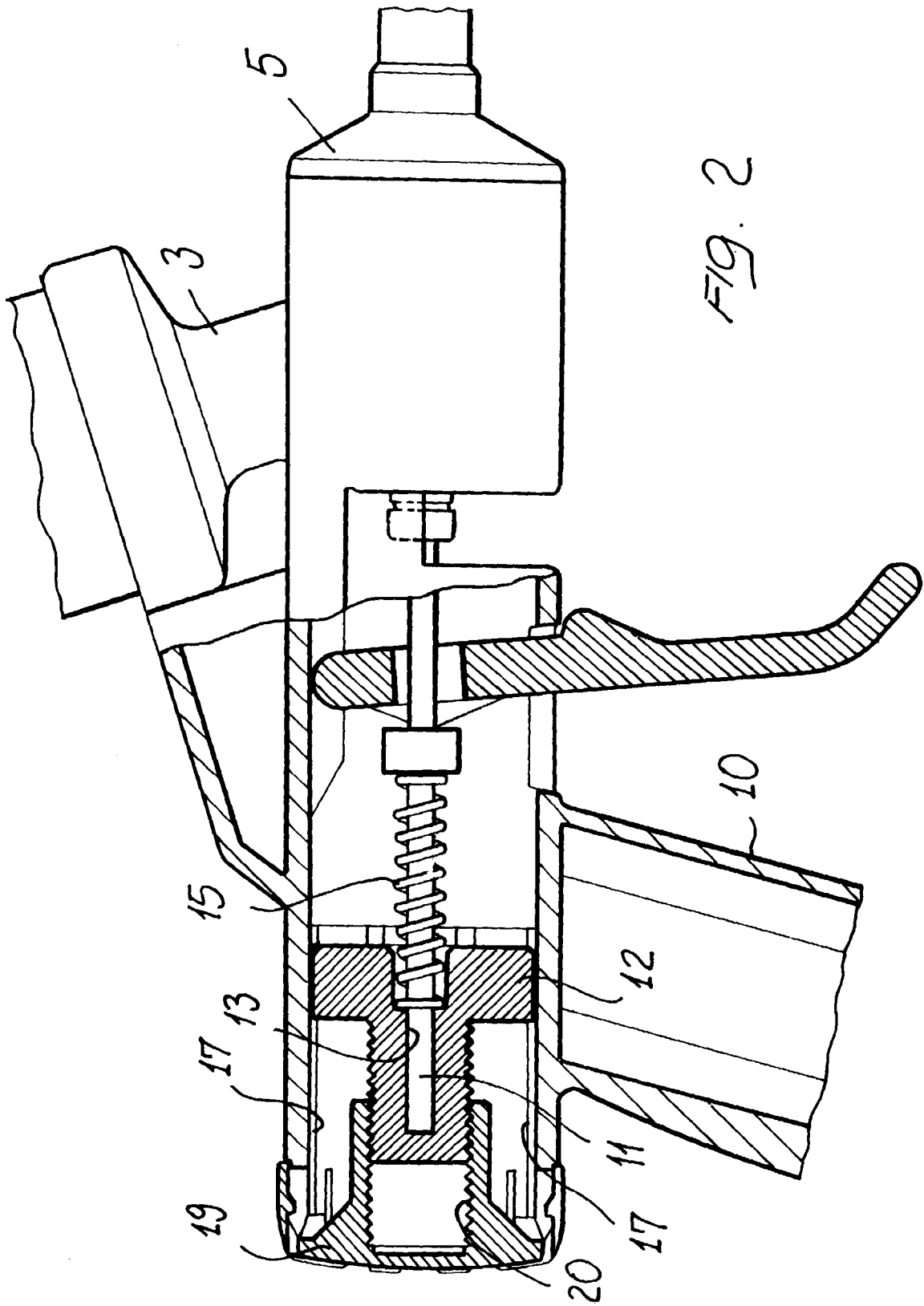
[0033] Thus, the mentioned bottom element cannot be accidentally disengaged or unthreaded.

[0034] In practicing the invention, the used materials and size can be varied, according to requirements and the status of the art.

Claims

1. A delivery gun, specifically designed for delivering foamed polyurethane, comprising a gun body, including a delivery tubular element, communicating with a material to be delivered vessel, and adapted to be coupled to said body, a sliding rod longitudinally sliding in said tubular element and having a conical end portion for engaging a delivery opening, said rod being adapted to disengage said opening during a backward movement thereof, the stroke of said rod being limited by end of stroke limit means and being characterized in that said end of stroke limit means comprise a rotary element, coupled to said body, and adapted to be driven from the outside, said rotary element being kinematically coupled to an abutment element, slidable with respect to said body, due to the rotary movement of said rotary element, and adapted to define the rear limit of stroke position of said rod.
2. A delivery gun according to Claim 1, characterized in that said rod is provided with a rear end portion adapted to engage in a blind hole of said abutment element, and that said abutment element comprises an annular recess, for housing therein an end portion of a coil spring, coaxial with said rod, the other end portion of said coil spring abutting against a flange of said rod, thereby to cause said rod to be arranged at a closure position thereof.
3. A delivery gun according to Claim 1 or 2, characterized in that said abutment element is slidably arranged in said gun body, and cannot turn about its longitudinal axis, by guides formed on said gun body, and being provided with a threaded portion for engaging a ring-nut formed in the rotary element.
4. A delivery gun according to one or more of the preceding claims, characterized in that said rotary element comprises signalling elements for signalling or detecting the position of said abutment element.
5. A delivery gun according to one or more of the preceding claims, characterized in that said delivery gun comprises one or more of the disclosed features, and substantially as broadly disclosed and/or illustrated in the preceding disclosure and in the figures of the accompanying drawings enclosed in the subject Utility Model Application.





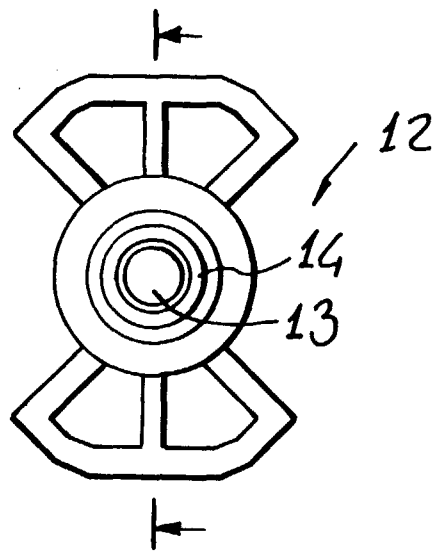


FIG. 3

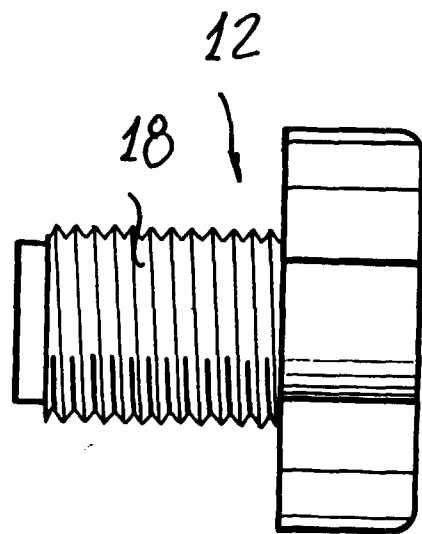


FIG. 4

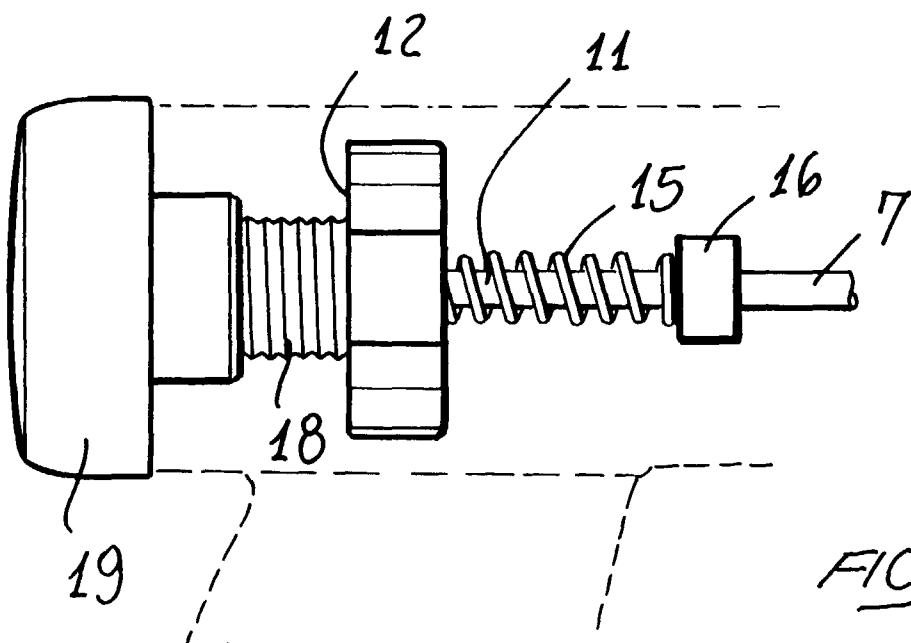


FIG. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 00 11 9259

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
X	US 5 683 544 A (KOPP VOLKER) 4 November 1997 (1997-11-04)	1,5	B29B7/74 B29B7/76
Y	* column 2, line 15-40; figure 1 *	2-4	B05B9/01 B05B7/12 B05B1/30
Y	US 5 687 913 A (ROBISCH HERMAN ET AL) 18 November 1997 (1997-11-18) * figure 2 *	4	
Y	DE 35 18 492 A (KOPPERSCHMIDT MUELLER & CO) 27 November 1986 (1986-11-27) * figure 1 *	2,3	
A	DE 37 10 395 A (JESSWEIN BRUNO) 13 October 1988 (1988-10-13) * figure 3 *	1-5	
A	EP 0 903 211 A (RIGO S R L) 24 March 1999 (1999-03-24) * column 3, line 51-54; figure 2 *	1-5	
			TECHNICAL FIELDS SEARCHED (Int.CI.7)
			B29B B05B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 5 December 2000	Examiner Kofoed, J
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 11 9259

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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05-12-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5683544 A	04-11-1997	DE 4412282 A	12-10-1995
		DE 59503110 D	17-09-1998
		EP 0676245 A	11-10-1995
		JP 9024318 A	28-01-1997
US 5687913 A	18-11-1997	JP 9108599 A	28-04-1997
DE 3518492 A	27-11-1986	NONE	
DE 3710395 A	13-10-1988	NONE	
EP 0903211 A	24-03-1999	IT MI972136 A	19-03-1999